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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/822,355	04/02/2001	Yury Gogotsi	204551US0	1726

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EXAMINER

LISH, PETER J

ART UNIT	PAPER NUMBER
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1754

DATE MAILED: 06/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/822,355

Applicant(s)

GOGOTSI ET AL.

Examiner

Peter J Lish

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 August 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-49 is/are pending in the application.
- 4a) Of the above claim(s) 17-26, 29 and 30 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 27 and 28 is/are allowed.
- 6) ☒ Claim(s) 1-11, 15, 16, 31-37, 39-41, 45-47 and 49 is/are rejected.
- 7) ☒ Claim(s) 12-14, 38, 42-44 and 48 is/are objected to.
- 8) ☒ Claim(s) 1-49 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-16, 27-28, and 31-49, drawn to a polyhedral graphite crystal, classified in class 423, subclass 447.2.
- II. Claims 17-26, drawn to a method for the production of graphite crystals, classified in class 423, subclass 448.
- III. Claims 29-30, drawn to a nanoscale screw/traveler device, classified in class 428, subclass 367.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product may be made by another and materially different process, such as the molding of a graphite fiber.

Inventions I and III are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention I has separate utility such as a microscopy probe. See MPEP § 806.05(d).

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Inventions II and III are at best related as process of making and product made. The inventions are distinct for a combination of the reasons given above.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

During a telephone conversation with Tom Barnes on June 4th, 2003, a provisional election was made with traverse to prosecute the invention of Group I, claims 1-16, 27-28, and 31-49. Affirmation of this election must be made by applicant in replying to this Office action. Claims 17-26 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, and 5-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Ruoff et al. (USPN 5,547,748).

Ruoff et al. teach, in column 4, the existence of “nanopolyhedra”, or carbon polyhedra composed of nested, concentric layers of graphite structure with dimensions on the order of nanometers to hundreds of nanometers. It is seen that these structures have a length and a diameter. Figure 2 specifically shows an example of a carbon polyhedral which has seven external facets. No difference is seen between the graphitic polyhedral of Ruoff et al. and that claimed by the instant application.

Claim 4 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Ruoff et al.

Ruoff et al. is applied above. Ruoff et al. does not explicitly teach the existence of a carbon polyhedral structure having nine facets. However, because there exist polyhedral structures with a variety of forms, see figures 1-3, it is expected that a polyhedral containing nine facets naturally occurs.

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Claims 1, 7, 8, 10, and 16 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Araki et al. (USPN 3,702,054).

Araki et al. teach the production of graphite fibers having different cross-sectional shape of various polygons. While it is not explicitly taught that these polygons have seven or more external facets, it is expected that the fibers of Araki et al. meet this condition because some of the fibers in figure 5 appear to have seven or more facets. It is expected that the external facets run “axially true” substantially the entire length of the fiber along long axis since pitch fibers are spun from an orifice which does not change during extrusion. Because of the variety of polygon structures, it is expected that at least some of the fibers of Araki have 7, 9, 11, and 14 facets.

Regarding claims 7, 10, and 16, no difference is seen between the graphite fibers of Araki et al. and the “needles” or “whiskers” of the instantly claimed invention.

Claims 1-7, 9-11, and 15-16 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Liu et al. (“Structures of carbon nanotubes studied...”).

Liu et al. disclose carbon nanotubes with lengths of up to one micron and diameters between 5 and 26 nanometers. It is not explicitly taught that these graphitic nanotubes have seven or more (such as 9, 11, or 14) external facets, however, this is expected because of the teaching that the cross-sections of these tubes are believed to be polygonal, with at least five straight regions. It is expected that the facets undergo at least a partial helical twist while running substantially the length of the long axis because nanotubes are known to have a helical structure.

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Regarding claims 10-11 and 15-16, no difference is seen between the fibers of Morita et al. and the “needles”, “giant nanotubes”, “nanorods”, or “whiskers” of the instantly claimed invention.

Claims 31-37, 39, 40-41, 45-46, 47, and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al. (“Structures of carbon nanotubes studied...”).

Liu et al. is applied above. Liu et al. do not explicitly teach the use of carbon nanotubes as reinforcement to a matrix. It would have been obvious to one of ordinary skill at the time of invention to use the carbon nanotubes of Liu et al. as the reinforcement to a matrix material, because it is well known in the art to use carbon nanotubes as strengthening materials in polymer or ceramic materials.

Allowable Subject Matter

Claims 12-14, 38, 42-44, and 48 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 27-28 are allowed.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter J Lish whose telephone number is 703-308-1772. The examiner can normally be reached on 9:00-6:00 Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 703-308-3837. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-305-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

PL
June 4, 2003



**STUART L. HENDRICKSON
PRIMARY EXAMINER**